Future shifting with present marking in Khalkha Mongolian

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Abstract

This paper examines a case of future temporal reference in Khalkha Mongolian (Eastern branch, Mongolic) that occurs in the absence of overt future morphology. When VPs are inflected solely with the tense morpheme *-n*, either a present or future reading can arise, leading past descriptions of the language to characterize *-n* as a non-past tense. However, the distribution of *-n* raises questions for current semantic theories of the future: if a modal semantics is necessary for future temporal reference due to the uncertainty of future eventualities, does the tense morpheme give rise to the future-shifted readings on its own, or is a modal operator (covertly) present? I present novel empirical evidence that such a modal operator appears covertly alongside *-n*, which I reclassify as a present tense due to its interactions with the Aktionsarten and aspect. While this modal is covert in affirmative sentences with *-n*, I show that it is overtly realized under negation as the morpheme *-kh*. The availability of both present and future readings is traced to an ambiguity between two underlying structures: one that is future-oriented, and one that is present-oriented. In the future-oriented structure, future temporal reference stems from the presence of a covert modal operator and covert prospective aspect. Altogether, I argue that a modal analysis of future reference is needed, even when no modal appears on the surface.

Keywords: Future, Aspect, Modality, Present tense, Khalkha Mongolian

1 Introduction

An unresolved issue in semantic theories of temporal reference concerns how future-oriented readings can arise in the absence of overt future marking (for an overview, see Bochnak, 2019). This paper focuses on such a case of future temporal reference in Khalkha Mongolian (Eastern branch, Mongolic), where sentences without future marking can be interpreted as future-shifted. In Khalkha Mongolian, when the tense suffix *-n* attaches to a verbal root like in (1), either a present or future interpretation can arise.[1] The temporal orientation of sentences

[1] When represented orthographically in Khalkha Mongolian, this tense suffix is written with a harmonized vowel following the nasal consonant (-на/-нэ/-но/-нө in the Mongolian Cyrillic alphabet, or *-na/-ne/-no/-nö*). However, the vowel is not pronounced. Thus, I follow Svantesson (1991) in transcribing this suffix as *-n*.

containing *-n* is dependent on the Aktionsart of the VP that *-n* attaches to: with eventive VPs (1a), only a future reading is possible, but with stative VPs (1b), either a present or future reading is available.

(1) a. Tselmeg shüleg unsh-**in**
Tselmeg poem read-*n*
'Tselmeg *reads/will read a poem.'

b. Bat minii nuuts-iig med-**n**
Bat 1SG.POSS secret-ACC know-*n*
'Bat knows/will know my secret.'

The availability of both present and future readings has led past descriptions of Khalkha Mongolian to characterize *-n* as a non-past tense marker (Binnick, 2012, 2016; Song, 1997; Svantesson, 1991), wherein the non-past tense introduces a reference time that is equivalent to or follows the time of speech. Other languages have also been characterized as having past versus non-past tense distinctions, such as German (Hilpert, 2008; Klein, 1994; Musan, 2002).

However, the existence of a non-past tense category raises questions for the semantics of future reference more generally. The inherent uncertainty of the future is argued to require the presence of a modal operator (e.g., Bochnak, 2019; Condoravdi, 2002; Thomason, 1970), rather than a purely temporal operator.[2] If non-past tenses contribute forward temporal shifting on their own, do they co-occur with a covert modal operator, or are they a case of non-modal future reference?

Further, the presence or absence of modality in sentences like (1) has consequences for determining the semantics of *-n* itself. In the absence of a future-oriented modal, a non-past tense analysis of *-n* is necessary to achieve the future-oriented readings of (1). This is because a present tense is unable to contribute a future reference time on its own, unlike the non-past. Alternatively, if a future-oriented modal operator were covertly present in (1), it would remove any need to treat the tense category of *-n* as non-past rather than present. Instead, the necessary future shifting would stem from this modal element, giving rise to the future readings in (1).

To address this question, I investigate the distribution of future readings for sentences with *-n* in Khalkha Mongolian. While both present and future temporal reference are available with *-n*, I argue that its distribution is incompatible with a non-past tense analysis and provide evidence that it is, instead, a present tense marker. How, then, do future readings arise if the tense is present, rather than non-past? I discuss data on the morphosyntax of negation and tense which supports the presence of a covert modal element in such cases: though this modal is covert in affirmative sentences, I argue that it is overtly realized under sentential negation as the morpheme *-kh*. In addition, because the modal *-kh* does not enforce future shifting, I propose that a covert prospective aspect must appear alongside this modal, following recent compositional accounts of future temporal reference (Bochnak, 2019; Kratzer, 2011; Mucha, 2016; Rivero, 2023).

The proposed structure for sentences with *-n* that receive future readings is shown in (2a). It is ambiguous with another structure in (2b) that results in present-orientation but is infelicitous with eventive VPs, which I trace to the 'present perfective paradox' (Bennett & Partee, 1972; De Wit, 2016; Malchukov, 2009; Ogihara, 2007).

[2] See Kissine (2008) for an alternative, non-modal treatment of *will*.

(2) a. Future-oriented structure:
$[_{TP}\ [_{ModP}\ [_{AspP}\ [_{AspP}\ [_{vP}\ \ldots]\ _{Asp}\ \textsc{prfv}]\ _{Asp}\ \textsc{prosp}]\ _{Mod}\ \textsc{mod}]\ _{T}\ \textsc{prs}]$

b. Present-oriented structure:
$[_{TP}\ [_{AspP}\ [_{vP}\ \ldots]\ _{Asp}\ \textsc{prfv}]\ _{T}\ \textsc{prs}]$

The uncited Khalkha Mongolian data presented in this paper were collected in consultation with speakers of the language using standard methods for semantic elicitation. Following Matthewson (2004) and Cover (2015), tasks used to elicit semantic data included discussion of the acceptability of sentences, judgments on their truth and felicity within discourse contexts, and translation between English and Khalkha Mongolian as needed.

The structure of the paper is as follows: in Section 2, I outline my preliminary theoretical assumptions on the semantics of tense, aspect, and modality. In Section 3, I provide data on the distribution of present and future readings with *-n* in Khalkha Mongolian, with particular attention given to the role of the Aktionsarten and aspect. In Section 4, I argue for an analysis of *-n* as a present tense. In Section 5, I give empirical evidence that future readings of sentences with *-n* are possible via the presence of a covert modal, which overtly surfaces under negation. In Section 6, I walk through a formal account of future reference in Khalkha Mongolian, where sentences with *-n* are ambiguous between two structures. For the structure that leads to a present-orientation, the present tense occurs alongside the perfective aspect, thus ruling out present-oriented readings with eventive VPs. For the structure that leads to a future-orientation, the present tense appears above a modal and prospective aspect, both of which are covert in affirmative sentences. Section 7 concludes.

2 Theoretical preliminaries

Throughout this analysis, I will presuppose a neo-Reichenbachian framework for tense and aspect (Klein, 1994; Reichenbach, 1947). Under this framework, tense determines the temporal relation between the *utterance time* (UT) and *reference time* (RT). Viewpoint aspect, on the other hand, is concerned with temporal relations between an RT and *eventuality time* (ET).

For the purposes of illustration, I will be using a quantificational semantics for tense throughout this paper (see Ogihara & Kusumoto, 2020). Under a quantificational theory of tense, tense introduces existential quantification over times, the domain of which is contextually restricted. An example is given for the past tense in (3). In (3), *g(i)* is a contextually-salient interval, and its superset relation with *t'*, the RT, restricts the domain of quantification. Though quantificational tenses are utilized here, the proposal outlined in this paper is also compatible with a pronominal theory of tense (Kratzer, 1998; Partee, 1973, 1984).

(3) $[\![\textsc{pst}_i]\!]^{g,c} = \lambda p.\exists t'\ [\ t' < t_c\ \&\ t' \subseteq g(i)\ \&\ p(t')]$

As a final preliminary assumption, my treatment of modality in the current analysis adopts a Kratzerian approach (Kratzer, 1981). As such, modals quantify over possible worlds, constrained by a modal base and ordering source. I assume that both the modal base and ordering source receive their specification via a contextually-supplied conversational background.

3 Future reference with *-n* in Khalkha Mongolian

In this section, I describe the distribution of the morpheme *-n* and the conditions that govern its temporal reference. I start by demonstrating once more that the interpretation of *-n* interacts with the Aktionsart of the VP it attaches to (Section 3.1). More precisely, the temporal orientation of the sentence depends on whether the verb is eventive (future-oriented only) or stative (future- or present-oriented). In Section 3.2, I then show that alongside the Aktionsart of the VP, the aspect of the sentence determines what temporal reference is available with *-n*: a future interpretation is only available with the perfective aspect (Section 3.2.1). In contrast, for the perfect or the imperfective, a future interpretation cannot arise, and the sentence must be interpreted as present (Section 3.2.1). Section 3.3 compares sentences with *-n* to instances of future readings with present tense morphology in other languages, such as futurates (Copley, 2002, 2008; Huddleston, 1977; Lakoff, 1971; Vetter, 1973) and future readings in subordinate clauses (Crouch, 1994; Kaufmann, 2005; Mendes, 2024; Rumberg & Lauer, 2023; Schulz, 2008), and shows that the future readings that occur with *-n* are distinct from these cases.

3.1 The Aktionsarten and *-n*

When attached to eventive VPs like those in (4), *-n* yields only future readings. Such sentences cannot be interpreted as present-oriented, as shown by their incompatibility with an indexical interpretation of present-oriented temporal adverbials like *odoo* 'now' in (4a) and (4c).[3] In comparison, future-oriented temporal adverbials are felicitous, such as *margaash* 'tomorrow' in (4b) and (4d).

(4) a. #Tselmeg odoo shüleg unsh-**in**
Tselmeg now poem read-*n*
Intended: 'Tselmeg reads a poem now.'

b. Tselmeg (margaash) shüleg unsh-**in**
Tselmeg (tomorrow) poem read-*n*
'Tselmeg will read a poem (tomorrow).'

c. #Khulan odoo urgamal ucal-**n**
Khulan now plant water-*n*
Intended: 'Khulan waters the plants now.'

d. Khulan (margaash) urgamal ucal-**n**
Khulan (tomorrow) plant water-*n*
'Khulan will water the plants (tomorrow).'

Unlike eventive VPs, stative VPs that appear with *-n* can be interpreted as either present- or future-oriented, as in (5). Because present temporal reference is available in addition to future reference, statives marked with *-n* are compatible with both present-oriented (5a, 5c) and future-oriented temporal adverbials (5b, 5d).

(5) a. Bat odoo minii nuuts-iig med-**n**
Bat now 1SG.POSS secret-ACC know-*n*
'Bat knows my secret now.'

[3] The sentences in (4a, 4c) are felicitous only under a non-indexical interpretation of 'now' (e.g., Altshuler, 2016; Anand & Toosarvandani, 2019), but even then, they only allow a future-oriented reading (i.e., "Tselmeg will read a poem now").

b. Bat margaash minii nuuts-iig med-**n**
Bat tomorrow 1SG.POSS secret-ACC know-*n*
'Bat will know my secret tomorrow.'

c. Khöshöö odoo uul-in oroi-d bairla-**n**
statue now mountain-GEN top-DAT be.placed-*n*
'The statue is placed at the top of the mountain now.'

d. Khöshöö margaash uul-in oroi-d bairla-**n**
statue tomorrow mountain-GEN top-DAT be.placed-*n*
'The statue will be placed at the top of the mountain tomorrow.'

3.2 Aspect and *-n*

In addition to the Aktionsart of the inflected verb, the temporal reference of sentences with *-n* is also sensitive to aspect. I now discuss the interpretation of *-n* with the perfective aspect (Section 3.2.1) versus the perfect and the imperfective (Section 3.2.2).

3.2.1 The perfective aspect in Khalkha Mongolian

To understand how aspect interacts with the temporal interpretation of *-n* in sentences without overt aspectual morphology like (1, 4–5), it is first necessary to clarify what the aspect of such sentences is. I propose that such sentences are interpreted as having a perfective viewpoint aspect.

To demonstrate this, I first consider sentences with *when*-clauses like (6), where the *when*-clause explicitly provides a punctual RT (e.g., Smith, 1991; Wurmbrand, 2014). In the example in (6a), Khulan's watering of the plants cannot be interpreted as happening at the same time as Tuya's arrival. The only available reading is one in which these events are sequential, which is characteristic of the perfective aspect. In (6b), where the verb is marked as imperfective, the events are instead interpreted as simultaneous: Khulan's watering of the plants overlaps with Tuya's arrival.[4]

(6) a. Tuya tsetserleg-t khüreelen-nd ochi-kh üye-d, Khulan urgamal ucal-**n**
Tuya garden-LOC park-DAT arrive-*kh* time-DAT Khulan plant water-*n*
'When Tuya arrives at the garden, Khulan will water the plants.' (Sequenced only)
≠ 'When Tuya arrives at the garden, Khulan will be watering the plants.'

b. Tuya tsetserleg-t khüreelen-nd ochi-kh üye-d, Khulan urgamal ucal-j
Tuya garden-LOC park-DAT arrive-*kh* time-DAT Khulan plant water-CVB
bai-kh bol-**n**
AUX-MOD become-*n*
'When Tuya arrives at the garden, Khulan will be watering the plants.

The contrast between (6a) and (6b) arises because the *when*-clause introduces an RT for the main clause that is shortly after the eventuality the *when*-clause describes (Hinrichs, 1986; Partee, 1984). Specifically, in (6), the RT of the main clause, t_{main}, closely follows the RT of the *when*-clause, t_{when} (i.e., the time of Tuya's arrival at the garden). This property of *when*-clauses interacts with the semantics of the perfective and imperfective as follows: the semantics of

[4] For future shifting with imperfectives, the relevant verb is marked with the converb *-j* and co-occurs with a participial form of the auxiliary *baikh* 'to be'. A higher verb, *bolokh* 'to become', is then inflected with *-n*.

the perfective states that the eventuality's duration is contained within the RT of the clause it appears in. Thus, for (6a), the duration of Khulan's watering of the plants is contained within t_{main}. Because t_{main} follows t_{when} and does not overlap with it, this means the eventualities contained by t_{main} and t_{when} do not overlap in time themselves. As a result, if the main clause has the perfective aspect, a sequenced reading is expected where Khulan's watering of the plants follows Tuya's arrival. This is the reading observed for (6a).

The temporal relation encoded by the semantics of the imperfective, in contrast, is reversed: it instead states that the ET contains the RT of the clause. As a result, in (6b), t_{main} is contained within the duration of Khulan's watering of the plants. By virtue of the imperfective's containment relation, this eventuality must also hold, minimally, at the times that immediately flank t_{main}. Since t_{main} is directly preceded by t_{when}, it overlaps with Khulan's watering of the plants. Thus, Khulan's watering of the plants is interpreted as occurring at the same time as Tuya's arrival in (6b).

The same behavior is observed for sentences marked with the past tense *-sAŋ*, as illustrated by (7). With no other verbal morphology present, a verb marked with *-sAŋ* in the main clause can only lead to a sequenced reading. Complementing the data on *-n* and *-sAŋ* given here, Munkhbat (2024) identifies a similar instance of perfectivity in Khalkha Mongolian for verbs that are marked with the direct evidential *-lAA* and no additional aspectual morphology. This evidence thus supports the proposal that sentences which are aspectually bare on the surface are interpreted as perfective in Khalkha Mongolian, regardless of what tense they are marked with. This parallels the behavior of 'simple present/past' sentences in English, where similar findings have been used to argue for the presence of a covert perfective aspect in their structures (Arregui, 2007; Wurmbrand, 2014).

(7) a. Tuya tsetsleg-t khüree-nd ochi-kh üye-d, Khulan urgamal ucal-**saŋ**
Tuya garden-LOC park-DAT arrive-*kh* time-DAT Khulan plant water-PST
'When Tuya arrived at the garden, Khulan watered the plants.' (Sequenced only)
≠ 'When Tuya arrived at the garden, Khulan was watering the plants.'

b. Tuya tsetsleg-t khüree-nd ochi-kh üye-d, Khulan urgamal ucal-j
Tuya garden-LOC park-DAT arrive-*kh* time-DAT Khulan plant water-CVB
bai-**saŋ**
AUX-PST
'When Tuya arrived at the garden, Khulan was watering the plants.'

Further support for the perfectivity of sentences where the verb is marked with *-n* comes from their infelicity when a punctual RT has been specified in a preceding question context (Mucha, 2016). I first demonstrate this for future marking via WOLL in English using examples from Mucha (2016), shown in (8).

(8) Speaker A: Can I meet Alex tomorrow at 6:00pm sharp?
a. No, Alex will be working.
b. #No, Alex will work. (from Mucha, 2016)

In (8), the adverbial in the preceding question sets the RT to 6:00pm. It is observed that WOLL is unacceptable in response to such questions when it appears above a bare verb (8b). The only acceptable response with WOLL is one in which the lower verb is inflected with *-ing* (8a), indicating imperfectivity.

The way this pattern is borne out stems, once again, from the different temporal relations encoded by the perfective versus imperfective aspects. As discussed before, the perfective aspect expresses a relation where the RT contains the eventuality's duration. However, in (8b), the RT is a single point in time, rather than an interval. Because the duration of the relevant eventuality (i.e., Alex's working) is not instantaneous and thus cannot be contained by a single time point, the perfective sentence in (8b) is infelicitous. The imperfective sentence in (8a), on the other hand, is felicitous. This follows from the aforementioned semantics of the imperfective: the punctual RT can be contained by the ET, rendering the sentence acceptable.

Khalkha Mongolian sentences with *-n* in a similar question context are given in (9). Because the preceding question specifies a punctual RT (i.e., 6:00pm), only the imperfective aspect in (9a) is felicitous. (9b), where *-n* appears without additional aspectual morphology, is infelicitous by comparison. The unacceptability of (9b) indicates that, like the English WOLL example in (8a), its aspect is perfective, which is responsible for the sentence's infelicity.

(9) Speaker A: Can I visit Oyuun tomorrow at 6:00pm sharp?

a. ügüi, Oyuun Ulaanbaatar luu ayal-aj bai-kh bol-**n**
No, Oyuun Ulaanbaatar towards travel-CVB AUX-*kh* become-*n*
'No, Oyuun will be traveling to Ulaanbaatar.'

b. #ügüi, Oyuun Ulaanbaatar luu ayal-**an**
No, Oyuun Ulaanbaatar towards travel-*n*
Intended: 'No, Oyuun will travel to Ulaanbaatar.'

Based on the data in (6–9), I conclude that when the verb is aspectually bare on the surface, it is interpreted as perfective. Under this view, I propose that examples with *-n* like (1–5) possess a covert perfective aspect morpheme, resulting in their aspectual interpretation. Taking this perspective, a revised generalization for the temporal interpretation of sentences with *-n* is as follows: only future readings of *-n* are available with the perfective aspect for eventive VPs, while both present and future readings are possible for their stative counterparts. I will return to the status of stative VPs in greater detail in Section 6.2, where I propose that in Khalkha Mongolian, statives are able to appear with the perfective.

3.2.2 The interpretation of *-n* with other aspects

Unlike the aforementioned perfective sentences, *-n* can only result in present temporal reference for other aspects, such as the perfect and the imperfective. In Khalkha Mongolian, the perfect is formed via the auxiliary *baikh* 'to be', which appears in a position above a past participle and is inflected for tense. To express the present perfect, *-n* appears on this higher auxiliary, as shown in (10). In these constructions, regardless of whether the verb is eventive (10a) or stative (10b), only present readings are possible. Future-oriented adverbials are disallowed in both cases.

(10) a. Tselmeg (#margaash) shüleg unsh-saŋ bai-**n**
Tselmeg (tomorrow) poem read-PST AUX-*n*
'Tselmeg has read a poem (#tomorrow).'
≠ 'Tselmeg will have read a poem tomorrow.'

b. Bat (#margaash) minii nuuts-iig med-seŋ bai-**n**
Bat (tomorrow) 1SG.POSS secret-ACC know-PST AUX-*n*
'Bat has known my secret (#tomorrow).'
≠ 'Bat will have known my secret tomorrow.'

The temporal reference of *-n* is also unambiguous for sentences with the imperfective aspect,[5] like in (11). As with the perfect examples in (10), both eventive (11a) and stative (11b) verbs are interpreted as present, and future-shifted readings are unavailable. This is exemplified once again by the infelicity of future-oriented adverbials.[6]

(11) a. Tselmeg (#margaash) shüleg unsh-ij bai-**n**
Tselmeg (tomorrow) poem read-CVB AUX-*n*
'Tselmeg is reading a poem (#tomorrow).'
≠ 'Tselmeg will be reading a poem (tomorrow).'

b. Bat (#margaash) minii nuuts-iig med-ej bai-**n**
Bat (tomorrow) 1SG.POSS secret-ACC med-CVB AUX-*n*
Literal: 'Bat is knowing my secret (#tomorrow).'
≠ 'Bat will be knowing my secret (tomorrow).'

In sum, I demonstrated in Sections 3.1–3.2 that for the perfective aspect, the temporal reference of *-n* depends on whether the VP it attaches to is eventive or stative: aspectually bare eventives always lead to future readings, and bare statives to either present or future readings. For other aspects, regardless of the verb's Aktionsart, only present temporal reference is available for sentences with *-n*.

3.3 A comparison with other future readings of present tense sentences

Before turning to my proposal for the semantic contribution of *-n*, I compare the conditions that license future readings with *-n* to other attested future readings for present tense sentences. It has been observed that in several languages, future readings are able to obtain for sentences with present morphology. In particular, futurates (Copley, 2002, 2008; Huddleston, 1977; Lakoff, 1971; Vetter, 1973) and future readings in subordinate clauses (Crouch, 1994; Kaufmann, 2005; Mendes, 2024; Rumberg & Lauer, 2023; Schulz, 2008) both result in future-orientation despite having present tense forms. Examples of each are given in (12a) and (12b), respectively.

(12) a. The San Francisco Orchestra performs tomorrow night.

b. If the orchestra plays the symphony with no mistakes, they practiced diligently.

Given these examples, a sensible hypothesis may be that the future readings of sentences with *-n* are of a similar species to either futurates or future readings in subordinate clauses. However, the availability of both is restricted: futurates require that there is the eventuality is

[5] It is worth pointing out that for sentences like (11), the imperfective is realized via the converb *-j*, which is attached to the verb, and the auxiliary *baikh* 'to be', which appears higher in the structure and inflects for tense. However, it has also been reported by past descriptions of Khalkha Mongolian that there is a morpheme which is a dedicated imperfective marker, *-(ɢ)AA*. I note that in affirmative sentences, *-(ɢ)AA* is typically only acceptable with the auxiliary *baikh* and rarely, if ever, can attach to other matrix verbs (e.g., Binnick, 2012; Song, 1997).

[6] The acceptability of stative VPs in these constructions indicates that the examples in (11) are not progressive like English *-ing*, which often leads to infelicity with stative predicates (Dowty, 1975, 1979; Lakoff, 1966), but are instead better treated as imperfective (e.g., Deo, 2009).

planned or scheduled to occur (Copley, 2002, 2008), and future readings in subordinate clauses are limited to subordinate clauses, as their name suggests (Mendes, 2024). These restrictions do not apply to future readings of sentences with *-n* in Khalkha Mongolian. In the absence of a planning context, the English futurate in (13a) is infelicitous, while a future reading is available in (13b) for Khalkha Mongolian.

(13) a. #It snows tomorrow.
b. Margaash tsas or-**n**
tomorrow snow enter-*n*
'It will snow tomorrow.'

Additionally, while subordinate future readings are felicitous only in subordinate clauses, like the antecedent of a conditional in (14a), such future interpretations are infelicitous in matrix clauses like (14b). In contrast, for verbs marked with *-n*, future interpretations like in (14c) are freely available in matrix clauses.

(14) Context: You are telling your friend about a local concert that you're going to, where your other friend Enkhbayar is performing. Enkhbayar is only good at playing specific instruments.
a. If Enkhbayar plays the saxophone, forgetting my ear plugs was a mistake.
b. #Enkhbayar plays the saxophone. (Present-oriented habitual only)
c. Enkhbayar saksofon toglo-**n**
Enkhbayar saxophone play-*n*
'Enkhbayar will play the saxophone.'

Thus, I conclude that the Khalkha Mongolian case constitutes a separate type of future reading that is distinct from both futurates and subordinate futures.

4 *-n* as a present tense marker

While the availability of both present and future temporal reference with *-n* has led prior descriptions of Khalkha Mongolian to label it as a non-past tense marker (e.g., Binnick, 2012; Song, 1997; Svantesson, 1991), I argue that such a characterization is unable to capture its behavior. I demonstrate this by walking through the predictions of a non-past tense account in Section 4.1, which makes incorrect predictions regarding the interpretation of *-n*. I then give evidence in Section 4.2 that rather than characterizing *-n* as a non-past tense marker, it should instead be treated as a present tense.

4.1 Against a non-past analysis of *-n*

To evaluate the predictions of a non-past tense account, I give a formalization for NON-PAST in (15). Under (15), a time *t'* is introduced that serves as the RT, and no subpart of *t'* may precede the UT. In other words, *t'* is either equivalent to or follows the UT. This treatment of NON-PAST is a reversal of the NON-FUTURE tense semantics given by Matthewson (2006) for St'át'imcets.

(15) a. $t' \geq t := \neg\exists t''[\, t'' \subset t' \,\&\, t'' < t\,]$
b. $[\![\text{NON-PAST}]\!]^{g,c} = \lambda p.\exists t'\,[\, t' \geq t_c \,\&\, p(t')(w_c)]$

Though the semantics in (15) correctly predicts the availability of both present and future reference with *-n*, there are three patterns that I will show it cannot predict: the interaction between temporal orientation and aspect (see Section 3.2), the inability of *-n* to introduce an RT that covers both the present and a future time (cf. Matthewson, 2006), and the licensing of modal subordination for sentences with *-n*.

To start, I consider how the NON-PAST semantics in (15) would interact with aspect. If *-n* were to contribute a non-past RT like in (15), future-shifted readings would be predicted to arise regardless of aspect, rather than be restricted to the perfective. As an example, let us walk through the predicted truth conditions for NON-PAST with the perfect aspect. To do so, it is first necessary to discuss the meaning of the perfect that I will be assuming for the sake of illustration.[7] In (16), a 'weak' extended now (XN) semantics for the perfect aspect is provided,[8] following Pancheva and Von Stechow (2004).

Under an XN theory of the perfect (e.g., Dowty, 1979; Iatridou, Anagnostopoulou, & Izvorski, 2001; McCoard, 1978), the perfect introduces a time interval referred to as the perfect time span (PTS). The relation encoded by $\leq$, as defined in (16a), requires that no subpart of the PTS follows the RT contributed by tense.[9] The relevant lexical entry for PERF is given in (16b).

(16) a. $t' \leq t := \neg\exists t''[\, t'' \subset t' \,\&\, t'' > t\,]$
b. $[\![\text{PERF}]\!]^{g,c} = \lambda p.\lambda t.\exists t'\,[\, t' \leq t \,\&\, p(t')\,]$

The perfect, which I take to be a high aspect, takes scope above viewpoint aspect and relates the RT introduced by tense to another RT (Iatridou et al., 2001; Pancheva, 2003; Pancheva & Zubizarreta, 2023). Viewpoint aspect, such as the perfective or imperfective, instead relates an RT to the ET. Taken together, when viewpoint aspect appears under the perfect, it is expressing a relation between the PTS (i.e., the RT introduced by the perfect) and the ET. Different readings of the perfect (e.g., the universal perfect, the experiential perfect, etc.) stem from the particular viewpoint aspect that appears below it (Iatridou et al., 2001; Pancheva, 2003). A sentence like (10a), repeated below in (17), receives an experiential perfect reading: it is entailed that the eventuality in question holds at a subset of the PTS.

(17) Tselmeg shüleg unsh-saŋ bai-**n**
Tselmeg poem read-PST.PRTCP AUX-*n*
'Tselmeg has read a poem.'
$\neq$ 'Tselmeg has been reading a poem.'

I model the experiential reading of the perfect in (17) by assuming that a perfective aspect is present in the structure beneath PERF (Iatridou et al., 2001; Pancheva, 2003). A lexical entry for PRFV is given in (18). (18) expresses a relation of containment between the RT and ET, with the RT containing the ET. While I will return to the semantics of the perfective in greater depth

[7] While the description of the perfect aspect's meaning that I give in this section follows a weak-XN semantics for the perfect (Pancheva & Von Stechow, 2004), other semantic theories of the perfect are present in the literature, such as the anteriority approach (Klein, 1994; Reichenbach, 1947) and the result state approach (e.g., Kamp & Reyle, 1993). See Grønn and Von Stechow (2020) for an overview.

[8] The semantics given in (16) constitutes a weak-XN approach because the right boundary of the PTS is not explicitly defined. In contrast, under a strong-XN approach, PERF states that the final subinterval (i.e., right boundary) of the PTS is equivalent to the RT provided by tense (Dowty, 1979).

[9] I note that the temporal relation provided by $\leq$ is the reverse of $\geq$, defined in (15a). Given that our semantics for NON-PAST is a reversal of the NON-FUTURE, this means the temporal relation involved in such a NON-FUTURE tense is equivalent to that of the perfect aspect, as Matthewson (2006) points out.

in Section 4.2, for the purposes of the current example, what is of note is that PRFV expresses that the PTS contains the ET when it is under the perfect aspect. This is what gives rise to the experiential reading.

(18) $[\![\text{PRFV}]\!]^{g,c} = \lambda P.\lambda t.\lambda w.\lambda t.\exists e\ [\ \tau(e) \subseteq t\ \&\ P(e)(w)\ ]$

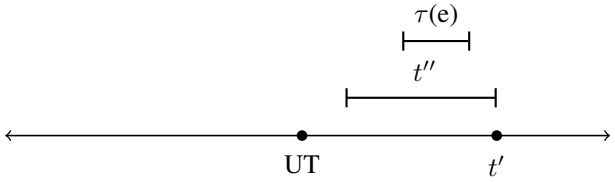
With this background on the perfect aspect in mind, the hypothesized structure for a sentence like (10a) under a non-past tense analysis is shown in (19a). In (19a), NON-PAST appears in a position above PERF. The predicted truth conditions for this structure are shown in (19b).

(19) a. $[_{TP}\ [_{PerfP}\ [_{AspP}\ [_{vP}$ Tselmeg read poem$]$ $_{Asp}$ PRFV$]$ $_{Perf}$ PERF$]$ $_{T}$ NON-PAST$]$

b. $[\![$(19a)$]\!]^{g,c}$ is true iff $\exists$t' [t' $\geq$ t_c & $\exists$t" [t" $\leq$ t' & $\exists$e [τ(e) $\subseteq$ t" & read(e, Tselmeg, poem, w_c)]]]

According to the truth conditions in (19b), future-oriented readings of the perfect should be available if *-n* were to contribute a non-past meaning. A visualization of a future-oriented configuration that would satisfy the truth conditions in (19b) is displayed in (20). A future time *t'* serves as the RT and the right boundary of *t"*, which is the PTS. *t"* extends from *t'* into the past and contains $\tau(e)$, the duration of a reading-a-poem event by Tselmeg. Each of *t'*, *t"*, and $\tau(e)$ is in the future, and none overlap with the UT. Yet, even though the non-past account predicts that a future perfect like in (20) is possible for the sentence (17), only a present perfect interpretation is available. Thus, the non-past tense semantics in (15) cannot successfully capture the aspectual data.

(20)



Further empirical evidence against analyzing *-n* as NON-PAST comes from its interpretation in sentences with conjoined subjects, which I base on the diagnostic used by Matthewson (2006) to argue for an underspecified NON-FUT tense in St'át'imcets. The logic behind this diagnostic is as follows: for distributive readings of conjoined subjects, there is a sub-event that corresponds to each subject. For instance, in a sentence like "Mozart and Salieri slept," there is a sub-event of Mozart's sleeping and a sub-event of Salieri's sleeping. These sub-events need not overlap temporally, so long as they both occurred within the RT. In other words, one could utter "Mozart and Salieri slept" in a scenario where they both slept in the past, but at different times. If an underspecified tense such as NON-FUT were to introduce an RT large enough to overlap with both the present and the past, it follows that NON-FUT should be acceptable in contexts where one sub-event is past-oriented and the other is present-oriented. In St'át'imcets, this prediction is borne out, as exemplified by (21).

(21) Context: I zánucwmas, cw7aoz kws ts'úqwaz'ams sJohn, nilh s7ícwa7 ests'wán i sútikas. Ts7as ta spipántseka, ts'úqwaz'am aylh sJohn. Cw7it i sts'wánsa. Cw7aoz t'u7 kws ts'úqwaz'ams sFred, nilh s7ícwa7 ests'wán lhkúnsa.

'Last year, John didn't go fishing, so he had no dried salmon last winter. Then summer came, and he went fishing. He got a lot of dried salmon. Fred didn't go fishing, so Fred has no dried salmon now.'

(wa7) zúqw-cen s-John múta7 s-Fred
(IMPF) die-foot NOM-John and NOM-Fred
'John and Fred were/are starving.' (not at the same time) (from Matthewson, 2006)

Applying this diagnostic to Khalkha Mongolian, a NON-PAST semantics predicts that it should be possible to mark a verb with *-n* to describe a scenario that has a non-overlapping (or, only partially overlapping) present-oriented sub-event and future-oriented sub-event. However, as seen in (22), this is not the case. *-n* is infelicitous when the temporal orientation of the two sub-events differs, shown in (22a), and is felicitous only when their temporal orientation is the same, like for the present context in (22b).

(22) a. Context: Your friends Nyamdorj and Pürevsüren are interested in the Icelandic language. Nyamdorj already knows Icelandic and speaks it fluently. Pürevsüren doesn't know any Icelandic yet, but he is planning to take an intensive class soon. He will be fluent when the class ends.

#Nyamdorj, Pürevsüren khoyor Island khel med-**n**
Nyamdorj, Pürevsüren two Iceland language know-*n*
Intended: 'Nyamdorj and Pürevsüren know/will know Icelandic.' (not at the same time)

b. Context: Your friends Nyamdorj and Pürevsüren are interested in the Icelandic language. Nyamdorj already knows Icelandic and speaks it fluently, and so does Pürevsüren.

Nyamdorj, Pürevsüren khoyor Island khel med-**n**
Nyamdorj, Pürevsüren two Iceland language know-*n*
'Nyamdorj and Pürevsüren know Icelandic.'

A final piece of evidence against a NON-PAST semantics like that in (15) is modal subordination being licensed for sentences with *n*. Modal subordination refers to the phenomenon where the prejacent of a modal operator is semantically subordinated by a modal operator in a previous sentence, leading to restrictions on presupposition satisfaction (Roberts, 1989, 1996). An English example is shown below in (23).

(23) a. If John bought a book, he will be reading it at home later. It will be a murder mystery. (adapted from Roberts, 1989)

b. If John bought a book, he was reading it at home yesterday. #It was a murder mystery. (adapted from Roberts, 1989)

In (23), the DP *a book* can only serve as an antecedent for the pronoun *it* in the second sentence if a modal operator is present, like WOLL in (23a). Otherwise, without a modal operator as in (23a), such anaphora is infelicitous. By virtue of its ability to diagnose modal elements, modal subordination has been used as an argument for the modal status of future expressions (Klecha, 2014).

The same contrast in felicity holds between sentences with *-n* in (24a) and sentences with a past tense and no modal operator in (24b). The former is a felicitous continuation, whereas

the latter is only acceptable if an epistemic modal is added. Modal subordination examples like (24a) pose difficulties for a non-past tense analysis of *-n*: if *-n* is indeed non-modal like in (15) and only introduces a non-past RT, why does modal subordination occur for sentences with *-n* where no modal operators are present on the surface?

(24) a. Context: You are telling your friend about a local concert that you're going to, where your other friend Enkhbayar is performing. You don't know what instrument he'll be playing. Enkhbayar is only good at playing specific instruments.

Enkhbayar gitar toglo-vol, kontsert saikhan bol-n. Üzegchid ilüü alga
Enkhbayar guitar play-COND concert nice become-*n* audience more palm
tash-**in**
clap-*n*
'If Enkhbayar plays the guitar, the concert will be nice. The audience will applaud more.'

b. Context: You are telling your friend about a local concert that happened yesterday, where your other friend Enkhbayar is performing. You didn't go to the concert, so you don't know what instrument he played. Enkhbayar is only good at playing specific instruments.

Enkhbayar gitar toglo-soŋ bol, kontsert saikhan bol-soŋ bai-kh. Üzegchid
Enkhbayar guitar play-PST COND concert nice become-PST AUX-*kh* audience
ilüü alga tash-**saŋ #(bai-kh)**
more palm clap-PST AUX-*kh*
'If Enkhbayar played the guitar, the concert must have been nice. The audience #(must have) applauded more.'

Taken together, the temporal reference of sentences with non-perfective aspects and conjoined subjects, as well as the occurrence of modal subordination, suggests that the behavior of *-n* cannot be derived under a non-past tense analysis. I now turn to an alternative analysis of its semantics.

4.2 The present perfective paradox

In Section 4.1, I demonstrated that an analysis of *-n* as a non-past tense does not predict the observed distribution of present and future readings. Maintaining a tense analysis of *-n*, I account for this data by proposing that *-n* should instead be treated as a present tense marker. My argument for this claim is as follows: if *-n* is a present tense, then the lack of present-oriented readings for perfective sentences with eventive VPs can be attributed to the cross-linguistic incompatibility between the perfective aspect and the present tense (e.g., Bennett & Partee, 1972; De Wit, 2016). To illustrate this phenomenon, also referred to as the 'present perfective paradox' (Malchukov, 2009), semantic entries are given in (25) for PRFV, repeated from (18), and PRS.

(25) a. $[\![\text{PRFV}]\!]^{g,c} = \lambda P.\lambda t.\lambda w.\exists e\ [\ \tau(e) \subseteq t\ \&\ P(e)(w)\ ]$

b. $[\![\text{PRS}]\!]^{g,c} = \lambda p.\exists t'\ [\ t' = t_c\ \&\ p(t')(w_c)]$

As previously discussed, the semantics of the perfective in (25a) states that the ET is located within a time *t*. In a present perfective sentence, *t* would be contributed by the present tense in (25b) and equivalent to the UT.

What, then, makes the present tense incompatible with the perfective aspect? The two accounts of 'simple present' sentences by Bennett and Partee (1972) and Ogihara (2007) provide different answers to this question. Under the explanation put forth by Bennett and Partee (1972), the UT is an instantaneous and fleeting point in time.[10] Thus, for an interval that is equivalent to the UT to contain the duration of an eventuality, per the semantics of the perfective aspect in (25a), the eventuality would also need to be instantaneous.

In contrast, Ogihara (2007) defines the UT not as punctual, but as an interval. The duration of this interval is the time it takes the speaker to utter a given sentence. Under this non-instantaneous definition, however, the duration of the event can now be plausibly contained by the UT. Take, for example, an accomplishment like *read a postcard* or an activity like *dance*: both can be completed within the time it takes to say a sentence. As a result, having an RT that is equivalent to the UT is, itself, not inconsistent with the temporal relation encoded by the perfective in (25a). Instead, Ogihara (2007) traces the incompatibility of the present and the perfective to the grammatical rule listed in (26).

(26) For any simple present sentence ϕ, I is the entire interval needed to utter ϕ. ϕ uttered at I is true iff for all subintervals I' of I, $[\![\phi]\!]^{I'}$ is true, where $[\![\alpha]\!]^{I'}$ indicates for any expression α its extension at I'. (from Ogihara, 2007)

The rule in (26) is concerned with what it means for a sentence to be true of the UT. According to (26), the described eventuality must hold throughout the UT interval in order for the sentence to be true, rather than holding *at* the UT. Only statives, which possess the subinterval property (Bennett & Partee, 1972), can satisfy this rule. A formal definition of the subinterval property is given in (27). Because the rule in (26) requires the sentence to hold at each subinterval of the UT, only a predicate with the subinterval property can guarantee the truth of the sentence at infinitesimally smaller subintervals.

(27) A predicate P possesses the subinterval property iff for every time interval I where P holds, P also holds at every subinterval I' of I. (from Bennett & Partee, 1972)

The interaction between the rule in (26) and the containment relation of the perfective is what rules out the unattested readings of eventive VPs. Further, even if the ET were equivalent in duration to the UT, as allowed by the non-proper subset relation in (25a), eventive VPs' lack of the subinterval property means that they are unable to hold throughout the UT (i.e., at each of its subintervals). With the rule in (26) not being satisfied, present perfective sentences are infelicitous with eventive VPs. (The case of stative VPs in such 'simple present' sentences and their consequences for these two different accounts will be discussed in Section 6.2.)

In sum, both Bennett and Partee (1972) and Ogihara (2007) predict the unacceptability of present perfective readings with eventive VPs. Across many languages, this prediction has been substantiated: cross-linguistically, when a sentence possesses an eventive VP marked with present perfective morphology (i.e., 'simple present' morphology), other temporal readings arise in lieu of the infelicitous present perfective (De Wit, 2016). I propose that in Khalkha Mongolian, aspectually bare verbs marked with *-n* constitute such a case of present perfective

[10] Similar characterizations of the UT are given by Dowty (1979) and Giorgi and Pianesi (1997) who, like Bennett and Partee (1972), also conceive of it as punctual.

morphology. By taking this approach, I make explicit the descriptive comparisons that have been drawn between sentences with *-n* in Khalkha Mongolian and simple present sentences in English (Binnick, 2016).

To understand how a future reading obtains with *-n*, I now discuss the attested temporal readings for sentences marked as present perfective across different languages. Languages vary with regards to the alternate interpretation that arises in such sentences. For languages like English, sentences with present perfective morphology receive habitual readings, as shown in (28a) (e.g., Cable, 2020; Deo, 2015). It is well-known that it is infelicitous to use such sentences to describe actions that are currently ongoing, as demonstrated by (28b), where the present progressive is preferred over the unacceptable perfective.

(28) a. (Every day,) Maryam drinks matcha.
b. (Right now,) Maryam is drinking/#drinks matcha.

One analysis of how this habitual interpretation arises for sentences like (28a) is to say that such sentences are ambiguous between two structures: one structure that contains a covert PRFV morpheme, whose incompatibility with the present renders it unacceptable, and the other structure contains a covert habitual operator (e.g., Cable, 2020). Examples of these proposed structures are shown in (29) for the sentence in (28a). With the present perfective structure ruled out, only the present-oriented habitual reading arises.

(29) a. #[$_{TP}$ PRS [$_{AspP}$ PRFV [$_{vP}$ Maryam drink matcha]]]
b. [$_{TP}$ PRS [$_{AspP}$ HAB [$_{vP}$ Maryam drink matcha]]]

For other languages, such as Russian, Polish, and Slovenian, sentences with present perfective morphology instead result in future-oriented readings (e.g., Comrie, 1976; De Wit, 2016; Malchukov, 2009; Rivero, 2023). In such languages, when a verb is marked with both present and perfective morphology like in (30), the eventuality it describes is interpreted as occurring in the future, rather than at the present. Given the future readings of sentences like (1), Khalkha Mongolian thus patterns like Russian and Polish concerning the present perfective paradox.

(30) On pri-det
he at.PRFV-come.PRS.3SG
'He will come.' (from Malchukov, 2009)

If we assume that such future readings result from a structural ambiguity, analogous to (29) for the English simple present, we would expect the following: (i) an infelicitous structure which contains both PRS and PRFV, and (ii) a felicitous structure which contains covert element(s) that introduce future-shifting. In the section that follows, I provide evidence for the latter structure in Khalkha Mongolian.

5 Covert modality and *-kh*

Based on how *-n* interacts with the Aktionsarten and aspect, I have argued that it is a present tense marker. However, this characterization raises a new question: if *-n* is strictly present tense, then what is contributing the future shifting in sentences like (1)? To answer this question, in Section 5.1, I first summarize current approaches to future reference in semantic theory (Bochnak, 2019; Kratzer, 2011; Mucha, 2016). In Section 5.2, I return our focus to

Khalkha Mongolian and show that despite being covert in affirmative sentences like (1), a modal element *-kh* surfaces in sentences with sentential negation. This pattern is traced to morphosyntactic restrictions on TAM marking and negation. I then probe the semantics of this modal in Section 5.3.

5.1 The semantic ingredients for future shifting

An emerging body of work on the semantics of future reference has proposed that future reference can be decomposed into distinct aspectual and modal morphemes, where the former introduces temporal future shifting and the latter introduces quantification over possible worlds (see Bochnak, 2019). For example, let us consider English sentences that express future temporal reference with *will* (e.g., "Mozart will play the harpsichord"). In these proposals, *will* is treated as a tensed form of the modal morpheme WOLL (Abusch, 1997). A toy semantics for WOLL under a decompositional approach is given in (31). In (31), WOLL is a modal quantifier that does not introduce any future RT itself (Kratzer, 2011; Mucha, 2016; Rivero, 2023).

(31) $[\![\text{WOLL}]\!]^{g,c} = \lambda p.\lambda t.\lambda w.\forall w' \in \text{Acc}(w,t)\ [\ p(t)(w')\ ]$ (adapted from Bochnak, 2019)

Because this modal is unspecified for time, the forward temporal shifting that is associated with future expressions must have another source. This is accomplished via a prospective aspect, the semantics of which is given in (32). The prospective aspect quantifies over times, introducing a time *t'* that is in the future relative to a time *t* that was introduced by tense. The modal in (31) takes scope over the prospective (Kratzer, 2011; Mucha, 2016).

(32) $[\![\text{PROSP}]\!]^{g,c} = \lambda p.\lambda t.\lambda w.\exists t'\ [\ t < t'\ \&\ p(t')(w)\ ]$

This semantics for the prospective aspect treats it as a type of high aspect, rather than viewpoint aspect (Pancheva & Zubizarreta, 2023). As discussed in Section 4.1, high aspects like the prospective in (32) and the perfect in (16) differ semantically from viewpoint aspects in that they establish a temporal relation between the RT provided by tense and an additional RT, rather than a relation between an RT and an ET.

I note two consequences of analyzing the prospective as high aspect. One conceptual consequence of the prospective being a high aspect is that it positions the prospective as a mirror to the perfect aspect: the perfect, as defined in (16), is subsequently an inverse of the prospective, introducing a relation of precedence between the two RTs rather than succession.

A second consequence of analyzing the prospective (and the perfect) as high aspects is that neither is able to encode a temporal relation with the ET on its own. Thus, it is necessary for a viewpoint aspect to appear in a lower position in order to relate the RT from high aspect to the ET. Support for such a role of viewpoint aspect can be found for both the perfect and the future. Perfect participle morphology (e.g., the perfective *-ed* versus the progressive *-ing* in English) has been analyzed as the realization of viewpoint aspect, resulting in different readings of the perfect (Iatridou et al., 2001; Pancheva, 2003). Viewpoint aspect has also been used to derive different future readings (Copley, 2002; Mucha, 2016; Rivero, 2023): similar morphological evidence is available for future expressions like English *will*, as verbs beneath *will* can be marked with *-ing* for a progressive reading and unmarked for a perfective or habitual reading (Mucha, 2016).

To recapitulate, the decompositional approach outlined here necessitates two separate morphemes for future shifting. Given this, Mucha (2016) proposes that languages may be parameterized regarding which of these elements surfaces in future-marked sentences. In other

words, languages are predicted to vary based on whether the modal, the prospective aspect, or both surface overtly. For example, a language can achieve future reference via a covert modal and an overtly marked prospective aspect, as with *dim* in Gitksan (Matthewson, Todorović, & Schwan, 2022) and *ta* in Paraguayan Guaraní (Pancheva & Zubizarreta, 2023; Tonhauser, 2011).[11] Other languages, such as English WOLL (Kratzer, 2011; Mucha, 2016) and Medumba *á'* (Mucha, 2016), are instead analyzed as only realizing the modal morpheme overtly, with the prospective aspect appearing covertly. Finally, there are also attested cases where both morphemes surface: Mucha (2013) argues that Hausa overtly encodes both the modal and prospective aspect. This is evidenced by the future-shifting requirements of the modal morpheme *zā* and its obligatory co-occurence with a low tone on weak subject pronouns, which are marked with TAM morphology in Hausa. Mucha (2013) analyzes this low tone as a prospective aspect. In Hausa, the surface co-occurrence of the prospective and modal is required for future marking.

Altogether, the future-marking typology described above includes languages of three types: (i) those with a covert MOD and overt PROSP, (ii) those with an overt MOD and covert PROSP, and (iii) those with an overt MOD and overt PROSP. However, another logically possible type of language is predicted by this typology: a language in which future shifting is achieved when MOD and PROSP are *both* unpronounced. In the sections that follow, I will argue that Khalkha Mongolian provides an example of such a language.

To support this proposal, in Section 5.2, patterns of sentential negation in Khalkha Mongolian are discussed. When a verb is inflected with the negator *-güi*, marking the verb for tense leads to ungrammaticality. Because of this, when sentences with *-n* are negated, the modal morpheme *-kh* surfaces instead. I take the realization of *-kh* under negation as evidence for the presence of a covert modal in sentences with *-n*. Thus, for future-oriented sentences with *-n*, Khalkha Mongolian expresses this futurity with two morphemes, both of which are covert in affirmative contexts: a prospective aspect, which is covertly present in a high aspectual position, and a modal, which is only overtly realized under negation. This analysis adds to the aforementioned cross-linguistic work on future reference (Matthewson et al., 2022; Mucha, 2016; Pancheva & Zubizarreta, 2023; Rivero, 2023; Tonhauser, 2011) by contributing an example of a language where the prospective aspect is always covert and the modal, though typically covert, can overtly appear in specific environments.

5.2 Interactions between negation and *-n*

Sentential negation in Khalkha Mongolian involves morphological alternations that, I argue, indicate the presence of a modal under *-n*. I illustrate this by giving an overview of how the morphosyntax of negation interacts with tense and aspect. Namely, verbs often bear different inflectional morphology in the presence of sentential negation than in their affirmative counterparts (Brosig, 2015; Svantesson, 1991).

Sentential negation is achieved through the negative operator *-güi*, which is involved in verbal inflection alongside tense and aspect markers. It is ungrammatical for *-güi* to co-occur with verbal suffixes that appear at higher structural positions, including tense markers like *-n*.

[11] In Gitksan, it's possible to overtly realize both a modal and prospective aspect as two separate morphemes (Matthewson et al., 2022). Future temporal reference is possible in Gitksan with only the prospective *dim* appearing on the surface and no overt modal, but *dim* can also appear alongside the circumstantial possibility modal *da'akhl̓xw*. Thus, as predicted by the decompositional view summarized here, a prospective aspect morpheme can surface simultaneously with a modal morpheme.

For example, the sentences in (33b) and (33c) are both judged as ungrammatical, regardless of whether the tense appears in a higher or lower position than negation.

(33) a. Margad (margaash) zakhia bich-**n**
Margad (tomorrow) letter write-*n*
'Margad will write a letter (tomorrow).'

b. *Margad (margaash) zakhia bich-**n-güi**
Margad (tomorrow) letter write-*n*-NEG
Intended: 'Margad won't write a letter (tomorrow).'

c. *Margad (margaash) zakhia bich-**güi-n**
Margad (tomorrow) letter write-NEG-*n*
Intended: 'Margad won't write a letter (tomorrow).'

Because *-n* is ungrammatical when it appears with *-güi*, in order to negate affirmative sentences with *-n* like (33a), negation must instead follow the suffix *-kh*. An example of this with an eventive VP is shown in (34). It should be noted that despite their morphological asymmetries on the surface, (34) maintains an interpretive relationship with (33a) (i.e., p vs. ¬p).

(34) Margad (margaash) zakhia bich-**ikh-güi**
Margad (tomorrow) letter write-*kh*-NEG
'Margad won't write a letter (tomorrow).'

A parallel set of examples with a stative VP under negation is given in (35).

(35) a. Erdenechimeg Frants khel med-**n**
Erdenechimeg France language know-*n*
'Erdenechimeg knows/will know French.'

b. Erdenechimeg Frants khel med-**ekh-güi**
Erdenechimeg France language know-*kh*-NEG
'Erdenechimeg doesn't/won't know French.'

This morphological asymmetry under negation arises because *-güi* is morphologically licensed only by certain verbal suffixes. One such suffix is the habitual morpheme *-dAg*, exemplified by (36) below.

(36) a. Shinee ödör bür tsonkh-oo tsewerle-**deg**
Shinee day every window-REFL.POSS clean-HAB
'Shinee cleans his windows every day.'

b. Shinee ödör bür tsonkh-oo tsewerle-**deg-güi**
Shinee day every window-REFL.POSS clean-HAB-NEG
'Shinee doesn't clean his windows every day.'

c. *Shinee ödör bür tsonkh-oo tsewerle-**güi(-deg)**
Shinee day every window-REFL.POSS clean-NEG(-HAB)
Intended: 'Shinee doesn't clean his windows every day.'

In the affirmative sentence in (36a), the habitual marker appears directly above the verbal root *tsewerle-* 'clean'. When this sentence is negated in (36b), *-güi* attaches above the habitual marker. It is ungrammatical for *-güi* to appear directly on a verbal root, as in (36c), whether

or not it bears *-dAg*. Thus, the overt presence of a verbal suffix like *-dAg* is a requirement for sentential negation to proceed, and the negator must attach higher than the suffix. Outside of negation, it is ungrammatical for a verbal root to appear without any sort of inflectional marking. This more general restriction against verbal roots appearing bare is the source of the ungrammaticality of (36c), rather than the presence of the negator itself.

As shown by the affirmative sentence in (36a) and its negative counterpart in (36b), when the verb is inflected with an overt aspectual suffix, tense is not phonologically realized on the surface, regardless of the polarity of the sentence. Still, the only possible temporal interpretation of (36a–36b) is present-oriented. I suggest that the present tense possesses two allomorphs: *-n*, and a covert form. In habitual examples like (36a–36b), it is the covert form that appears. This stems from a morphosyntactic restriction against multiple overt TAM morphemes attaching to a single verbal root in Khalkha Mongolian. More complex TAM inflection (i.e., the overt realization of more than one TAM category) instead requires an additional auxiliary verb in the structure, which is then inflected with the additional TAM morpheme. I show such an example with the habitual marker and the past tense in (37a), along with a negated form in (37b). This auxiliary is only necessary when there is an additional overt suffix to host. Khalkha Mongolian is not unique in this respect: similar behavior of verb periphrasis is attested cross-linguistically, dubbed the overflow pattern by Bjorkman (2011), with relevant examples including Kinande (Bjorkman, 2011) and Turkish (Kim, 2024; Rivero, 2023).

(37) a. Shinee ödör bür tsonkh-oo tsewerle-**deg bai-saŋ**
Shinee day every window-REFL.POSS clean-HAB AUX-PST
'Shinee cleaned his windows every day.'

b. Shinee ödör bür tsonkh-oo tsewerle-**deg-güi bai-saŋ**
Shinee day every window-REFL.POSS clean-HAB-NEG AUX-PST
'Shinee didn't clean his windows every day.'

What happens when the tense morpheme is the only overt TAM morpheme, like in future-shifted sentences with *-n*? As seen with the habitual marker in (36b), certain verbal suffixes are able to host negation. However, negation is only licensed by aspectual suffixes that form verbal participles (Brosig, 2015). More specifically, this set of suffixes consists of the following four morphemes (alongside a descriptive label of the participle they appear in): *-dAg* (the habitual participle), *-sAŋ* (the past participle), *-(ɢ)AA* (the imperfective participle), and *-kh* (the "future" participle).

The reason for the incompatibility between *-n* and sentential negation shown in (33) stems from the position that the negator *-güi* can occupy: *-güi* can attach only to a verbal participle, and it cannot attach above TP. I characterize the NegP projection that *-güi* appears at as a position that is above AspP, but below TP, depicted in (38) (see Lim, 2025, for a similar syntactic characterization). Because sentential negation is typically thought to involve negating quantification over events, it is unsurprising that *-güi* would occupy such a position (Acquaviva, 1997; Zeijlstra, 2022). This is because the structure in (38) places *-güi* above vP, the locus of existential closure over events (Diesing, 1992).

(38) $[_{TP}\ [_{NegP}\ [_{AspP}\ [_{vP}\ \ldots]\ \text{Asp}\ ]\ \text{Neg}\ ]\ \text{T}\ ]$

For an interpretive symmetry to still hold between affirmative sentences with *-n* and their negative counterparts like (34, 35b), it is necessary that the semantic contribution of the verbal participle inflected with *-kh* parallels that of verbs inflected with *-n*. The *-kh* morpheme

appears in various syntactic environments outside of these negated sentences, suggesting it is not simply an allomorph of *-n* under negation. To unpack the semantics of the *-kh* morpheme, I next explore its distribution and argue for its status as modal.

5.3 A family resemblance with modals

The previous section demonstrated that when affirmative sentences with *-n* are negated, a different morpheme, *-kh*, surfaces under negation instead. The *-kh* morpheme has been given various descriptive labels in the Mongolic literature, as an irrealis mood (e.g., Song, 1997; Svantesson, 1991) or an infinitival/future (Binnick, 2012). Drawing from these past characterizations, I propose that *-kh* is a modal element. To argue for this, I now present seven data points which show that *-kh* possesses a family resemblance with other modals. In particular, outside of negation, *-kh* appears in several contexts which implicate modality.

First, one construction that requires the presence of *-kh* is counterfactual conditionals. In order for a counterfactual interpretation to obtain, the *-kh* morpheme must appear in the consequent, inflected on.a verb beneath a perfect auxiliary. This is shown by (39), where (39a) is interpreted as a counterfactual, as opposed to an indicative conditional like (39b).

(39) a. Uyanga shükher-ee mart-saŋ bol ter boroo-nd nor-**okh** bai-saŋ
Uyanga umbrella-REFL.POSS forget-PST COND 3.SG rain-DAT get.wet-*kh* AUX-PST
'If Uyanga had forgotten her umbrella, she would have gotten wet in the rain.'

b. Uyanga shükher-ee mart-saŋ bol ter boroo-nd nor-**n**
Uyanga umbrella-REFL.POSS forget-PST COND 3.SG rain-DAT get.wet-*n*
'If Uyanga forgot her umbrella, she will get wet in the rain.'

The finding in (39) is not unexpected if *-kh* is thought to have a similar semantics to English WOLL. For conditionals in English, as well as in Modern Greek, a counterfactual interpretation is only possible with a WOLL-like morpheme in its consequent (Iatridou, 2000). English examples are illustrated in (40), where a present counterfactual in (40a) is contrasted with an indicative conditional in (40b).

(40) a. If Mozart had composed an opera in Russian, Salieri would have attended one of its performances.

b. If Mozart composed an opera in Russian, Salieri attended one of its performances.

The presence of WOLL in the consequent of counterfactuals is commonly thought to introduce quantification over historically possible worlds, which stem from the past RT introduced in the antecedent (Arregui, 2007; Ippolito, 2003; Khoo, 2017). For the example in (40), the past tense morphology on the verb *compose* sets the RT as a time *t* that precedes the time at which the counterfactual is spoken. Future-oriented, modal morphology like WOLL can thus generate branching futures that extend from *t*, rather than from the UT. As a consequence, because *t* is a past time, alternative futures are accessible from *t* that are not accessible from the UT.

Second, the height of *-kh* determines its interpretation: when *-kh* appears in a high syntactic position on an auxiliary, it gives rise to an epistemic reading, as in (41). While *-kh* often appears on verbal participles, it is available in a non-participial form when it inflects on the auxiliary in (41).

(41) Context: Every day at noon, Enkhjin takes a break from work to go on a walk. Right now, it's noon.

Enkhjin alkha-j bai-ɢaa bai-**kh**
Enkhjin walk-CVB AUX-IPF AUX-*kh*
'Enkhjin must be walking.' (Epistemic)

The effect of the syntactic height of *-kh* is again captured if *-kh* is a modal element. Cross-linguistically, when a modal receives an epistemic reading, it is argued to appear in a syntactic position that scopes over tense, while root modals take scope under tense (e.g., Cinque, 1999; Hacquard, 2009). The way this positional difference between epistemic and root interpretations of modals with the same form (e.g., English *may*/*must*) is derived in the literature has varied, with relevant analyses involving event-relative interpretations of modals (Hacquard, 2010) or semantic type constraints (Kush, 2011). For the current proposal, I set aside the precise derivation of how the position of *-kh* alters its modal flavor, as well as why *-kh* is restricted to verbal participles and the aforementioned auxiliary.

Third, *-kh* can trigger modal subordination (Roberts, 1989, 1996). As discussed in Section 4.1, modal subordination is only licensed if a modal operator is present in each of the sentences in the relevant discourse. In (42), repeated from (24b), the presence of *-kh* on a higher auxiliary ameliorates the infelicity of the simple past sentence. Thus, this suggests that *-kh* has a modalized semantics.

(42) Context: You are telling your friend about a local concert that happened yesterday, where your other friend Enkhbayar is performing. You didn't go to the concert, so you don't know what instrument he played. Enkhbayar is only good at playing specific instruments.

Enkhbayar gitar toglo-soŋ bol, kontsert saikhan bol-soŋ bai-kh. Üzegchid
Enkhbayar guitar play-PST COND concert nice become-PST AUX-*kh* audience
ilüü alga tash-**saŋ #(bai-kh)**
more palm clap-PST AUX-*kh*
'If Enkhbayar played the guitar, the concert must have been nice. The audience #(must have) applauded more.'

Fourth, negation is unable to scope above *-kh* when it is in a high position, shown in (43).[12] This is consistent with the behavior of epistemic modals in other languages, where quantifiers, including negation, cannot outscope epistemic modals (von Fintel & Iatridou, 2003). Thus, examples like (43) provide additional evidence that when an auxiliary is inflected with *-kh* (rather than a tense marker like *-n*), it acts as an epistemic modal.

(43) Context: Enkhjin is your coworker who is a bit lazy. You know that every day at noon, Enkhjin takes a break from work to take a long nap. Right now, it's noon.

a. *Enkhjin alkha-j bai-ɢaa bai-**kh**-güi
Enkhjin walk-CVB AUX-IPF AUX-*kh*-NEG
Intended: 'Enkhjin must not be walking.' (Epistemic)

[12]The Khalkha Mongolian speakers who were consulted vary in whether they accept sentences like (43b), where negation appears beneath the epistemic modal. Crucially, however, all of the speakers judged sentences where negation appears above the epistemic modal as ungrammatical.

b. Enkhjin alkha-j bai-**kh**-güi bai-**kh**
Enkhjin walk-CVB AUX-*kh*-NEG AUX-*kh*
'Enkhjin must not be walking.' (Epistemic)

Fifth, the acquaintance inference of predicates of personal taste (PPTs) is obviated under *-kh*, like with other modals (Anand & Korotkova, 2018; Klecha, 2014; Ninan, 2014; Pearson, 2013). When PPTs appear in the simple present, they give rise to an 'acquaintance inference': the speaker is inferred to have first-hand experience that the PPT holds of the object. If a speaker were to utter a sentence like "Listening to Mozart is fun," one would assume that they had listened to Mozart before. However, when PPTs appear under modal elements, this acquaintance inference is obviated. If a speaker were to instead state that "Listening to Salieri must be fun," no inference would arise that they had listened to Salieri's music beforehand.

The examples in (44) show that the acquaintance inference is indeed obviated under *-kh* in (44a), but it remains under present-oriented interpretations of *-n* in (44b), where the *-n*-marked auxiliary is optionally pronounced.[13] The obviation that occurs in (44a) is, then, an additional piece of evidence in favor of a modal treatment of *-kh*.

(44) Context: Your friend just made you *süütei tsai*, a salted tea drink, using their secret recipe. You've never tried their *süütei tsai* before. However, they've made tasty drinks for you before, and they always use high-quality ingredients.

a. Ene süütei tsai amttai bai-**kh** bai-**kh**
this milky tea delicious AUX-*kh* AUX-*kh*
'This *süütei tsai* must be delicious.' (Epistemic)

b. #Ene süütei tsai amttai (bai-**n**)
this milky tea delicious AUX-*n*
Intended: 'This *süütei tsai* is delicious.'

Sixth, *-kh* can appear on a high auxiliary in cases of abductive reasoning. Abductive reasoning involves drawing inferences about the cause of an eventuality from the eventuality itself (Peirce, 1955). For instance, say that your friend, who has always been blonde, walks in the room with red hair. You thus conclude that she must have dyed it. This is a case of abductive reasoning: it is inferred that the having-red-hair eventuality was caused by a hair-dyeing event.

In contrast, with deductive reasoning, which is a non-abductive form of reasoning, inferences can instead be made about the eventuality from its cause. Now, imagine that your friend calls you on the phone, and she tells you that she just used red hair dye. Because you know that using hair dye leads to a change in hair color, you conclude that her hair is now red. This reasoning is non-abductive: it is inferred that the hair-dyeing event caused a having-red-hair eventuality.

In English, while epistemic *must* is felicitous in cases of abductive inference, WOLL results in infelicity (Winans, 2016). When *-kh* inflects on a high auxiliary, (45) shows that it patterns like English epistemic *must*. Two contexts are given in (45) based on the examples of abduction discussed in Winans (2016). In (45a), which is an adapted version of the barbecuing context from Winans (2016), the inferred cause is an ongoing eventuality, whereas

[13] Unlike other statives, copular uses of *baikh* 'to be' can only be interpreted as present when inflected with *-n*. I leave an analysis of why the future-oriented reading is exceptionally unavailable with copular sentences to future work.

in (45b), the inferred cause is a plan for a future eventuality.[14] In (45b), the eventuality that triggers the inference is Oyuun's lawnmower being left by her door. If seeing the lawnmower makes Tengis conclude that Oyuun is going to mow her lawn later, then this serves as an explanation for why her lawnmower is outside in the first place. Because this inference is from an eventuality to its cause, this is an instance of abductive reasoning.

(45) a. Context: Tengis knows that his neighbor, Oyuun, grills meats often. Tengis is taking a walk with his friend around the neighborhood, and he smells smoke.

Oyuun odoo makh shar-aj bai-kh bai-**kh**.
Oyuun now meat grill-CVB aux-*kh* aux-*kh*
'Oyuun must be grilling meat now.' (Epistemic)

b. Context: Tengis knows that his neighbor, Oyuun, mows her lawn often. Tengis is taking a walk with his friend around the neighborhood, and he sees a lawnmower by Oyuun's door.

Oyuun udakhgüi züleg-ee khad-akh bai-**kh**
Oyuun soon grass-REFL.POSS mow-*kh* AUX-*kh*
'It must be the case that Oyuun will mow the lawn soon.' (Epistemic)

As shown by Winans (2016), in cases of abductive reasoning, WOLL is infelicitous, unlike *must*. The same contrast holds in Khalkha Mongolian, shown in (45b). Along with the prior data points, the felicity of *-kh* with abductive inferences indicates that it behaves like an epistemic modal when it is syntactically high.

Seventh, when *-kh* appears in a low position on a participle, I provide further evidence that suggests it behaves like a root modal. In sentences with deontic necessity interpretations like (46), *-kh* attaches to the verb and appears underneath the phrase *yos-toi* (lit. 'with the rules'). When (46) is considered alongside the interpretation of *-kh* under negation in (34) and in counterfactuals in (40–47), it is clear that *-kh* is not specified as epistemic, but rather, its modal flavor is underspecified.

(46) Context: You and your friends, Sarangerel and Khulan, are going to an art museum. The museum requires tickets to enter the new exhibit. Both you and Khulan purchased tickets online beforehand, but Sarangerel hasn't bought her ticket yet. You're reminding Khulan what Sarangerel needs to do to see the exhibit.

Sarangerel bilet av-**akh yos-toi**
Sarangerel ticket buy-*kh* rule-with
'Sarangerel must purchase a ticket.' (Deontic)

Based on the seven pieces of evidence given in this section, the distribution of *-kh* parallels other modals cross-linguistically. Thus, I conclude that *-kh* is a modal element with an underspecified flavor. In Section 6, I will discuss my proposal for its semantics in greater detail. In sentences with *-n*, though there is no overt modal element in affirmative contexts, I argue that the presence of a covert modal element is supported by *-kh* surfacing when these sentences are negated.

[14] The infelicity of the sentence with *-n* in (45a) provides additional reason to believe that *-n* is not a non-past tense: while the non-abductive requirement of (45a) can be readily accounted for if a WOLL-like modal operator is present, it is less apparent where the infelicity stems from if the only element involved contributing futurity is a non-past tense.

5.4 *-kh* itself does not encode futurity

Given the modality of *-kh*, a rational hypothesis might be that future-shifting is a part of its semantics as well. Under this perspective, the modal and temporal components which are necessary for the semantics of the future would be collapsed into a single morpheme.

However, in backward counterfactuals, future-shifting is not required by *-kh*, indicating that *-kh* marks modality but not futurity. This is demonstrated in (47), where both counterfactuals have backtracked interpretations, made explicit by the inclusion of a present-oriented temporal adverbial in their antecedents and a past-oriented temporal adverbial in their consequents. If *-kh* itself were specified for a future RT (i.e., contributing temporal shifting forwards), it would be predicted to mismatch with the temporal reference of the adverbials and be infelicitous with these constructions.

(47) a. Khervee önöödör gazar möstei bai-saŋ bol öchigdör khuitei bai-**kh** bai-saŋ
if today ground icy AUX-PST COND yesterday cold AUX-*kh* AUX-PST
'If there had been ice on the ground today, it would have been cold yesterday.'

b. Khervee önöödör gadaa chiigtei bai-saŋ bol öchigdör boroo or-**okh** bai-saŋ
if today outside wet AUX-PST COND yesterday rain enter-*kh* AUX-PST
'If it had been wet outside today, it would have rained yesterday.'

Thus, the fact that *-kh* is acceptable in (47) suggests that *-kh* itself does not enforce future-shifting, providing supporting an analysis where *-kh* is a modal quantifier which lacks temporal specification.

6 A formal analysis of temporal reference with *-n*

To account for the distribution of present and future temporal reference for verbs marked with *-n* in Khalkha Mongolian, I analyze these different readings as arising from an ambiguity between two structures. These two structures are shown in (48), repeated from (2). In the current section, I will provide further motivation for each element represented in these structures, as well as a formal analysis of their semantics.

(48) a. Future-oriented structure:
$[_{TP}\ [_{ModP}\ [_{AspP}\ [_{AspP}\ [_{vP}\ \ldots]\ _{Asp}\ \textsc{prfv}]\ _{Asp}\ \textsc{prosp}]\ _{Mod}\ \textsc{mod}]\ _{T}\ \textsc{prs}]$

b. Present-oriented structure:
$[_{TP}\ [_{AspP}\ [_{vP}\ \ldots]\ _{Asp}\ \textsc{prfv}]\ _{T}\ \textsc{prs}]$

In Section 4, I argued for the status of *-n* as a marker of the present tense, rather than a non-past tense. The semantics for PRS are repeated below in (49). As discussed before, the present tense provides an RT that is equivalent to the UT.

(49) $[\![\text{-}n]\!]^{g,c} = [\![\textsc{prs}]\!]^{g,c} = \lambda p.\exists t'\ [\ t' = t_c\ \&\ p(t')(w_c)\ ]$

In the absence of a non-past tense, the semantic contribution of the present tense *-n* on its own is not sufficient for future temporal reference. In light of this, I conclude that future-shifting in sentences *-n* must stem from a separate source. To this end, I take the overt realization of the morpheme *-kh* under negation as evidence for the presence of a covert modal in affirmative, future-oriented sentences with *-n*.

As illustrated in Section 5.3, the modal element *-kh* is compatible with both epistemic and root modal flavors. I note that the appropriate modal base for future expressions remains an unsettled topic, with proposed modal bases for futures including metaphysical (Condoravdi, 2002), circumstantial (Abusch, 2012), and epistemic (Giannakidou & Mari, 2018). While disambiguating between these proposals is outside the scope of the current paper, I will assume here that *-kh* has a circumstantial modal base for the relevant future cases, following Abusch (2012), and a stereotypical ordering source. The semantics of *-kh* for the relevant future-oriented sentences is given in (50), which doubles as the semantics of the covert modal operator in future readings with *-n*.

(50) $[\![\text{-}kh_{\text{CIRC}}]\!]^{g,c,h} = [\![\text{MOD}_{\text{CIRC}}]\!]^{g,c} = \lambda p.\lambda t.\lambda w.\forall w' \in \text{BEST}_{h(w,t)}(\bigcap \text{MB}_{\text{CIRC}}(w,t))\ [\ p(t)(w')\ ]$

Because *-kh* does not require forward temporal shifting, the semantics for *-kh* in (50) only quantifies over worlds and is not specified for any future times. I propose that a temporal component, specifically a null prospective aspect morpheme, is needed to introduce a future RT. A semantics for PROSP is given in (51), where PROSP introduces an RT which temporally succeeds the RT from tense.

(51) $[\![\text{PROSP}_i]\!]^{g,c} = \lambda p.\lambda t.\lambda w.\exists t'\ [\ t < t'\ \&\ t' \subseteq g(i)\ \&\ p(t')(w)\ ]$

In (51), quantification over future times is restricted by *g(i)*, which picks out a time interval that is salient in the context of the utterance. An empirical reason to include a restriction on quantification comes from examples like (52): the truth conditions of these sentences, intuitively, would not be met if there was *any* future time at which Uyanga drank water. Such a sentence would only ever be false in a limited number of scenarios, as drinking water is necessary for Uyanga to live. In (52), the prediction in question revolves around whether Uyanga will drink water during the dinner party, and, thus, the future time introduced by PROSP needs to be restricted to only those times.

(52) Context: You've invited your friends over for a dinner party. While your friend Uyanga usually prefer to drink wine, you recently learned that she's pregnant. You're talking about the drink she'll be having at the party instead.

a. Uyanga will drink water.

b. Uyanga us uu-**n**
Uyanga water drink-*n*
'Uyanga will drink water.'

Following cross-linguistic work on the future, the prospective aspect is treated as a high aspect in (51), thus relating two RTs (Mucha, 2016; Pancheva & Zubizarreta, 2023). A lower viewpoint aspect is, then, necessary beneath PROSP to encode a relation to the ET. When sentences with *-n* lack overt aspectual morphology, they are interpreted as perfective, a semantics for which can be seen in (25a).

While the imperfective, as a viewpoint aspect, should also be able to appear under PROSP in both structures in (48), Section 3.2.1 illustrated that this is not the case: the relevant future-oriented structure is only available with the perfective. I propose that this is due to a selectional restriction imposed by PROSP, where it selects for PRFV. This claim is supported by how future-shifting is accomplished for the imperfective, shown in (6b, 9a): a higher verb *bolokh* 'to

become' is required, to which the necessary PRFV can attach. This claim is in line with similar language-specific selectional restrictions attested for high aspects elsewhere. The Greek perfect, for example, requires a perfective viewpoint aspect (Iatridou et al., 2001).

I will now show how these semantic components come together to derive the meaning of eventive VPs marked with *-n* in Section 6.1, followed by stative VPs in Section 6.2.

6.1 Eventives

Let's consider the sentence in (53), repeated from (33a), where the eventive VPal root *bich-* 'write' is inflected with *-n*. This sentence can only receive a reading where Margad is predicted to write a letter at a future time, rather than a reading in which the letter is being written at the UT.

(53) Margad (margaash) zakhia bich-**n**
Margad (tomorrow) letter write-*n*
'Margad *writes/will write a letter (tomorrow).'

Under this proposal, there are two possible syntactic structures for the sentence in (53), both of which are given in (54). Due to the incompatibility between the present tense and perfective aspect, as discussed in Section 4.2, the structure in (54b) is infelicitous.

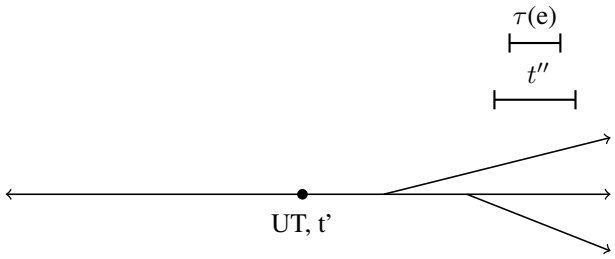
(54) a. $[_{TP}\ [_{ModP}\ [_{AspP}\ [_{AspP}\ [_{vP}$ Margad write letter$]_{Asp}$ PRFV$]_{Asp}$ PROSP$]_{Mod}$ MOD$]_{T}$ PRS$]$
b. #$[_{TP}\ [_{AspP}\ [_{vP}$ Margad write letter$]_{Asp}$ PRFV$]_{T}$ PRS$]$

The future-oriented structure in (54a), on the other hand, does not result in infelicity due to the semantic contribution of PROSP. This is demonstrated by the truth conditions of (54a), shown in (55): the future time t'' introduced by PROSP is what contains the duration of the eventuality $\tau(e)$, rather than a time that is equivalent to the UT.

(55) $[\![(54a)_i]\!]^{g,c,h}$ is true iff ∃t' [t' = t_c & ∀w' ∈ $\text{BEST}_{h(w_c,t')}(\bigcap \text{MB}_{\text{CIRC}}(w_c,t'))$ [∃t'' [t' < t'' & t'' ⊆ g(i) & ∃e [τ(e) ⊆ t'' & write(e, Margad, letter, t'', w')]]]]

A configuration that verifies the truth conditions in (55) is displayed in (56). Here, the branches extending from the timeline are a visual representation of different possible worlds which diverge from the actual world.

(56)



Even though the proposed future-oriented structure contains both a present tense and a perfective aspect, accounts of the present perfective paradox (Bennett & Partee, 1972; Ogihara,

2007) still predict (55) to still be satisfiable for eventive verbs. Under a Bennett and Partee (1972) view, t'' could be an interval rather than an instantaneous point, thus enabling t'' to contain eventualities of longer durations. For Ogihara (2007), the present perfective paradox is traced to the grammatical rule in (26) and only applies when the relevant eventuality overlaps with the UT. Because $\tau(e)$ in (55) must be contained in t'', which succeeds the UT rather than overlapping with it, this grammatical rule is not violated.

When a sentence like (53) is negated, the present tense *-n* is not pronounced, and the verbal root is instead inflected with the modal *-kh* and the negator *-güi*. This is shown in (57), repeated from (34).

(57) Margad (margaash) zakhia bich-**ikh-güi**
Margad (tomorrow) letter write-*kh*-NEG
'Margad won't write a letter (tomorrow).'

A structure for the negated sentence in (57) can be seen below in (58). Here, the negator is realized at a NegP that is above the modal but beneath tense.

(58) [$_{TP}$ [$_{NegP}$ [$_{ModP}$ [$_{AspP}$ [$_{AspP}$ [$_{vP}$ Margad write letter] $_{Asp}$ PRFV] $_{Asp}$ PROSP] $_{Mod}$ MOD] $_{Neg}$ NEG] $_{T}$ PRS]

The relevant truth conditions are shown in (59). While the syntactic position of the negator is above the modal operator, it takes semantic scope above event quantification instead, consistent with other cases of sentential negation cross-linguistically (Acquaviva, 1997; Zeijlstra, 2022).[15] If negation were interpreted veridically to its syntactic position, the expected meaning for a sentence like (57) would be as follows: not every world includes a future time *t"* that contains the duration of a writing-a-letter event by Margad. Put differently, (57) would incorrectly be predicted to mean that Margad will take a photo at *t"* in some worlds, but not all. A similar set of scopal predictions arises when the past tense appears alongside negation, as laid out by Partee (1973) for the well-discussed "I didn't turn off the stove!" example.

(59) $[\![(58)_i]\!]^{g,c,h}$ is true iff ∃t' [t' = t_c & ∀w' ∈ $\text{BEST}_{h(w_c,t')}(\bigcap \text{MB}_{\text{CIRC}}(w_c,t'))$ [∃t" [t' < t" & t" ⊆ g(i) & ¬∃e [τ(e) ⊆ t" & write(e, Margad, letter, t", w')]]]]

Further precedence for the scope of negation being inflexible alongside the future comes from the behavior of WOLL in English. In examples like (60), regardless of whether negation scopes above or below WOLL, its truth conditions are unchanged (Cariani & Santorio, 2018; Copley, 2002; MacFarlane, 2014; Thomason, 1970). Therefore, the fact that the WOLL-like operator *-kh* is impervious to the scope of negation in sentences like (57) is unsurprising. While the semantics given above for the future does not explicitly derive this scopeless behavior, I note that it could be readily amended to do so: for instance, WOLL-like operators have been treated as possessing a homogeneity presupposition (Copley, 2002), or alternatively derived via a semantics that utilizes a selection function rather than possible world quantification (Cariani & Santorio, 2018).

(60) a. The symphony will not perform tomorrow.
b. It is not the case that the symphony will perform tomorrow.

[15] While sentential negation is often thought to scope over events, other negators are possible: in Bengali, while the negator *na* behaves similarly to the above, the negator *ni* is argued to negate quantification over times (Ramchand, 2001).

Finally, I point out that the only difference between the truth conditions in (59) and their affirmative counterpart in (55) is the presence of negation. Thus, this analysis captures the interpretive relationship between affirmative and negative constructions in Khalkha Mongolian, despite their morphological asymmetry on the surface.

6.2 Statives

In Section 6.1, I argued that in the case of eventive VPs, there is an ambiguity between two underlying structures. Both of these structures contain the perfective aspect at a low AspP, but one is rendered infelicitous due to the present perfective paradox. Turning to statives, a structural ambiguity with *-n* is also present, resulting in the availability of both present- and future-oriented readings like in (1b). However, because statives are traditionally thought to be incompatible with the perfective aspect (Bary, 2009; De Swart, 1998; Dieuleveut, 2023; Homer, 2021; Mari & Martin, 2007), it is not clear whether the same pair of structures underlies the ambiguity for both eventives and statives. In order to derive the temporal ambiguity with stative VPs, then, a question first needs to be answered: what aspectual elements are present when stative VPs are marked with *-n*? I give background on the interaction between perfectivity and statives in Section 6.2.1 before presenting my analysis in Section 6.2.2, where I advance an account of statives inflected with *-n* that treats them as perfective.

6.2.1 On viewpoint aspect and statives

In languages like French (Dieuleveut, 2023; Homer, 2021; Mari & Martin, 2007) where perfectivity is overtly marked, statives are reported to be unacceptable with the perfective. This incompatibility is thought to arise from a boundedness requirement in the semantics of the perfective, which necessitates that the RT contains both the start and end of the relevant eventuality (De Swart, 1998; Dieuleveut, 2023; Mari & Martin, 2007). Stative VPs, unlike eventive VPs, lack a definitive start or end point and are thus unbounded (e.g., Altshuler & Schwarzschild, 2013). Thus, because the unboundedness of statives is at odds with the boundedness requirement of the perfective aspect, the two categories are predicted to be incompatible.

In order to adhere to the boundedness requirement in languages like English, where an absence of overt aspectual morphology results in perfective readings, it is typical to treat statives as instead appearing with a covert imperfective aspect (Deo, 2009; Dowty, 1979).[16] Since stative VPs in English like in (61a) cannot be marked with overt progressive morphology (Dowty, 1975; Lakoff, 1966), their continuous meaning is thought to stem from this unpronounced imperfective instead. However, I point out that in contrast with English, stative VPs in Khalkha Mongolian can be overtly marked as imperfective, as in (61b), repeated from (11b), or as habitual in (61c). If it is the case that aspectually bare stative VPs in Khalkha Mongolian involve covert imperfective morphology, as has been proposed for English, it would then be necessary to explain why the imperfective can optionally be realized as either overt or covert. It would also be necessary to account for why the same optionality does not hold for eventive VPs,

[16] In Kamp and Reyle (1993), an alternative approach is taken via DRT to capture the relationship between the (im)perfective aspect and stativity. Rather than proposing covert morphemes, temporal location conditions are utilized to distinguish between eventive versus stative VPs: the relevant condition for eventives states that for an event e and location time t, $\tau(e) \subseteq t$. The condition for statives is instead such that for a state s and location time t, $t \subseteq \tau(s)$. Under this approach, the Aktionsart of the VP, rather than viewpoint aspect, drives the distinction.

which can only receive an imperfective interpretation when there is imperfective morphology on the surface.

(61) a. #The professor is knowing my name.

b. Bat minii nuuts-iig **med-ej** **bai-n**
Bat 1SG.POSS secret-ACC know-CVB AUX-*n*
Literal: 'Bat is knowing my secret.'

c. Erdenechimeg Frants khel **med-deg**
Erdenechimeg France language know-HAB
Literal: 'Erdenechimeg (habitually) knows French.'

It has also been debated whether statives like *know my secret* in (61b) lack an eventuality argument entirely, either because of their status as Kimian states Maienborn (2007), which by definition are unable to be located spatiotemporally, or simply by virtue of being a stative in the first place (Katz, 2003). Yet, in Khalkha Mongolian, such statives can still be contrastively marked for viewpoint aspect like in (61). If the stative in (61b) lacked an eventuality argument altogether, this would be unexpected under standard Neo-Reichenbachian approaches due to how viewpoint aspect relates an RT to an ET. Put differently, it would not be possible for a stative like *know my secret* to satisfy the existential quantification over eventualities introduced by viewpoint aspect if it did not have an eventuality argument in the first place.

Where does this leave us with regards to the perfective aspect and statives? It should be noted that the meaning of the perfective aspect is subject to cross-linguistic variation. For example, perfective aspects in Hindi, Mandarin, and Thai do not entail culmination of accomplishments (e.g., Altshuler, 2014; Koenig & Muansuwan, 2000; Singh, 1998; Smith, 1991). Such a non-culminating example is given for Mandarin in (62), where the perfective does not entail that both the start and end of the *writing a letter* event are contained in the RT. Thus, taking cross-linguistic examples like (62) into consideration, it is unclear whether the boundedness requirement holds of the perfective aspect universally.

(62) Wo zuotian xie-le gei Zhangsan de xin, keshi mei xie-wan
1.SG yesterday write-PRFV to Zhangsan DE letter but NEG write-finish
'I wrote a letter to Zhangsan yesterday, but I didn't finish it.' (from Smith, 1991)

Additionally, recent work on the semantics of the perfect has independently proposed the existence of perfective statives to derive the contrast between experiential and universal readings of the perfect (e.g., Rouillard, forthcoming; von Fintel & Iatridou, 2019). When statives appear with the perfect, experiential and universal readings are both available, shown in (63). For the experiential in (63a), it is inferred that Colleen's tiredness ended prior to the UT. With the universal in (63b), it is entailed that Colleen is still tired at the UT.

(63) a. Colleen has been tired before, (but she isn't now). (Experiential)

b. Colleen has been tired ever since her surgery, (#but she isn't now). (Universal)

As discussed in Section 4.1, for eventives, the experiential reading is thought to arise when the perfective appears under the perfect (Iatridou et al., 2001; Pancheva, 2003). If the stative in (63a) were imperfective, though, a reading where the eventuality holds only at a subset of the PTS should not be available.[17] The temporal relation encoded by the imperfective in

[17] See Pancheva (2003) for an analysis of the experiential readings of statives which uses a 'neutral imperfective' (Smith, 1991) instead of the perfective.

(64) would lead both sentences in (63) to entail that the ET contains the PTS. Since the right boundary of the PTS for the present perfect is the UT (see Section 4.1), then the ET would therefore contain the UT. However, this prediction is at odds with the actual meaning of the experiential in (63a), where the being-tired eventuality need not hold anymore. For this reason, the availability of experiential readings with statives points away from an account in which statives are incompatible with the perfective.

(64) $[\![\text{IMPF}]\!]^{g,c} = \lambda P.\lambda t.\lambda w.\exists e\ [\ t \subset \tau(e)\ \&\ P(e)(w)\ ]$

In light of these observations, I argue that there is not sufficient evidence to rule out these stative VPs being aspectually perfective in Khalkha Mongolian. I therefore put forth an alternative analysis to account for the viewpoint aspect of these statives: I propose that like the eventive VPs, aspectually bare stative VPs appear alongside a covert perfective aspect.

6.2.2 Deriving the Khalkha Mongolian statives

I argue that the temporal meaning of statives marked with *-n* can, too, be derived via the pair of structures in (48), just like the eventives. The implementation of this account centers around two insights: (i) because statives have the subinterval property (Bennett & Partee, 1972), a subinterval of the state itself may satisfy the perfective's semantics, and (ii) per Ogihara (2007), a grammatical rule is active that requires eventualities overlapping with the UT interval to hold throughout the UT, which only statives can satisfy.

The subinterval property states that if the eventuality is true at some interval *I*, then it is also true at every subinterval of *I* (Bennett & Partee, 1972). Thus, because stative VPs possess the subinterval property, they are true not only for the maximal interval they hold over, but also for each of its subintervals. It is this property of stative VPs that allows them to satisfy the semantics of the perfective aspect in (25a). The existential quantification over eventualities in (25a) requires only that there is at least one eventuality whose duration is either a subset of or equal to the RT. Therefore, for a state *s*, one of its substate s_{sub} would be able to verify this temporal relation imposed by the perfective: even if the maximal interval that *s* holds over contains the RT, a sufficiently small subinterval (i.e., the duration of s_{sub}) that is equivalent in duration to the RT would satisfy (25a). Therefore, regardless of whether the UT is treated as a point (e.g., Bennett & Partee, 1972) or as an interval (e.g., Ogihara, 2007), the subinterval property results in the felicity of perfective statives in the present tense.

That being said, I opt to follow the account of the present perfective paradox in Ogihara (2007) rather than the original proposal of Bennett and Partee (1972) in order to capture the behavior of achievement VPs with the present tense. Despite being punctual, achievements like *become* in (65) are unable to receive a present perfective reading (Dieuleveut, 2023). This is puzzling if the punctuality of the UT is the source of the present perfective paradox, as the duration of the achievements in (65) should be equivalent to the UT and thus satisfy the semantics of the perfective in (25a).

(65) a. Nomin bagsh bol-**n**
Nomin teacher become-*n*
'Nomin *becomes/will become a teacher.'

b. Eli becomes happy (whenever I see him/#now).

However, assuming a grammatical rule like (26), the lack of present perfective readings for achievements can be accounted for. Achievements, being punctual, are unable to hold throughout the interval of the UT, resulting in their infelicity with the present tense and perfective aspect. Statives, on the other hand, are able to hold throughout the UT interval, as discussed in Section 4.2. For this reason, I adopt the rule in (26). I will now lay out the details of this account for the sentence in (66), repeated from (35a).

(66) Erdenechimeg Frants khel med-**n**
Erdenechimeg French language know-*n*
'Erdenechimeg knows/will know French.'

Treating the stative examples as perfective, the relevant structures are displayed in (67). Like the eventive VPs, there is an ambiguity between a present-oriented and a future-oriented structure. However, both structures, including the present perfective in (67b), are felicitous for stative VPs. This leads to the availability of the present-oriented reading.

(67) a. [$_{TP}$ [$_{ModP}$ [$_{AspP}$ [$_{AspP}$ [$_{vP}$ Erdenechimeg know French] $_{Asp}$ PRFV] $_{Asp}$ PROSP] $_{Mod}$ MOD] $_{T}$ PRS]

b. [$_{TP}$ [$_{AspP}$ [$_{vP}$ Erdenechimeg know French] $_{Asp}$ PRFV] $_{T}$ PRS]

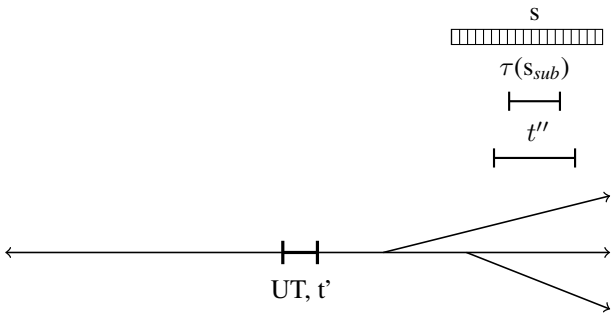
The subsequent truth conditions for the affirmative sentences with statives are shown in (68). (68a) displays the truth conditions for the future-oriented reading, and (68b) displays the truth conditions for the present-oriented reading. In (68a), the future time *t"* from PROSP contains the duration of a state *s*, but in (68b), where both MOD and PROSP are absent, a time that is equivalent to the UT contains the duration of *s* instead.

(68) a. $[\![(67a)_i]\!]^{g,c,h}$ is true iff $\exists$t' [t' = t_c & $\forall$w' $\in$ $\text{BEST}_{h(w_c,t')}(\bigcap \text{MB}_{\text{CIRC}}(w_c,t'))$ [$\exists$t" [$\exists$s [τ(s) $\subseteq$ t" & t' $<$ t" & t" $\subseteq$ g(i) & know(s, Erdenechimeg, French, t", w')]]]]

b. $[\![(67b)]\!]^{g,c}$ is true iff $\exists$t' [t' = t_c & $\exists$s [τ(s) $\subseteq$ t' & know(s, Erdenechimeg, French, t', w_c)]]

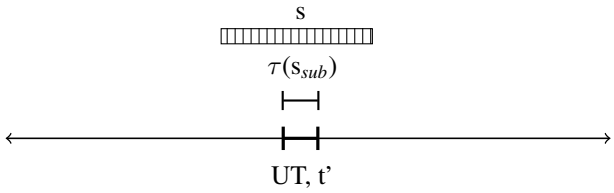
I now show two configurations that verify the truth conditions in (68). First, I give a configuration in (69) that verifies the future-oriented truth conditions in (68a). Though *s* itself extends past the bounds of *t"*, there still exists a substate of *s*, s_{sub}, whose duration is contained within *t"*. Therefore, the configuration in (69) renders (68a) true.

(69)



Second, a configuration that verifies the present-oriented truth conditions in (68b) is displayed in (70). Once again, the duration of *s* contains *t'* (i.e., the UT). Regardless, however, there still exists an s_{sub} that is equivalent in duration to *t'*. Because the semantics of the perfective in (25a) simply requires the existence of an eventuality whose duration is contained by or equivalent to *t'*, this is satisfied via s_{sub}.

(70)



Moving onto their negated counterparts, a negated version of (66) is shown in (71), repeated from (35b).

(71) Erdenechimeg Frants khel med-**ekh**-**güi**
Erdenechimeg French language know-*kh*-NEG
'Erdenechimeg doesn't/won't know French.'

The future-oriented and present-oriented negated structures for the sentence in (71) are shown in (72). Consistent with eventives under negation, the structures in (72) differ from their affirmative counterparts only in the presence of a NegP projection.

(72) a. [$_{TP}$ [$_{NegP}$ [$_{ModP}$ [$_{AspP}$ [$_{AspP}$ [$_{vP}$ Erdenechimeg know French] $_{Asp}$ PRFV] $_{Asp}$ PROSP] $_{Mod}$ MOD] $_{Neg}$ NEG] $_{T}$ PRS]

b. [$_{TP}$ [$_{NegP}$ [$_{AspP}$ [$_{vP}$ Erdenechimeg know French] $_{Asp}$ PRFV] $_{Neg}$ NEG] $_{T}$ PRS]

The truth conditions for both negated structures are given in (73). The only difference between the affirmative truth conditions in (68) and their negated counterparts is the presence of a negative operator. Given this, the current analysis captures the interpretive relationship between affirmative and negative constructions for the relevant statives, as with the eventives.

(73) a. $[\![(72a)_i]\!]^{g,c,h}$ is true iff $\exists$t' [t' = t_c & $\forall$w' $\in$ $\text{BEST}_{h(w_c,t')}(\bigcap \text{MB}_{\text{CIRC}}(w_c,t'))$ [$\exists$t'' [t' < t'' & t'' $\subseteq$ g(i) & $\neg\exists$s [τ(s) $\subseteq$ t'' & know(s, Erdenechimeg, French, t'', w')]]]]

b. $[\![(72b)]\!]^{g,c,h}$ is true iff $\exists$t' [t' = t_c & $\neg\exists$s [τ(s) $\subseteq$ t' & know(s, Erdenechimeg, French, t', w_c)]]

Before moving on, I want to draw attention to the fact that while no modal element is specified in the present-oriented structure in (72b) or its truth conditions in (73b), the modal morpheme *-kh* still surfaces when a present reading obtains under negation in (71). If the present reading does not implicate modality in the same way as the future reading, what leads to the appearance of *-kh* in this environment? One possibility is as follows: because the negator cannot attach directly to a verbal root (see Section 5.2), the irrealis environment imposed by negation warrants the realization of *-kh* (Miestamo, 2005; Phillips, 2023; von Prince, Krajinović, & Krifka, 2022).

Overall, I have provided a semantic analysis of sentences with the present tense marker *-n* in Khalkha Mongolian where future readings stem from a covert modal and covert prospective aspect in lieu of a non-past tense. By positing these covert morphemes, I account for the interpretive relationship between the truth conditions of affirmative sentences with *-n* and their negative counterparts with *-kh*. After demonstrating this analysis for the temporal reference of eventive VPs (Section 6.1), I then extended its claims to the stative cases in Section 6.2.

An additional theoretical consequence of this analysis bears on the relationship between stativity and perfectivity. To what degree do languages vary in the range of aspectual categories that can appear with stative VPs? In Section 6.2, I have modeled the relevant stative VPs as co-occurring with the perfective aspect in Khalkha Mongolian (cf. De Swart, 1998; Mari & Martin, 2007). Taken together with their ability to appear with imperfective and habitual morphology in (61b, 61c), this analysis treats Khalkha Mongolian as a language where stative VPs can combine more freely with different viewpoint aspects.

7 Conclusion

In this paper, I have developed an account of future temporal reference in sentences without overt future marking in Khalkha Mongolian. I derive futurity not from the contribution of a non-past tense, but instead from the presence of a covert prospective aspect and a covert modal, the latter of which surfaces only under negation. The proposal outlined in this paper supports the status of future temporal reference as modal, rather than non-modal: even though the modal operator does not overtly surface alongside VPs marked with *-n*, its presence can nonetheless be detected. Thus, Khalkha Mongolian exemplifies a previously unattested pattern of future marking in which both the modal and prospective aspect are unpronounced.

The extent to which this proposal of future shifting in the absence of future marking extends to other attested cases of non-past tenses remains to be seen: are there true instances of non-modal, non-past tenses? I have shown that at least in the case of Khalkha Mongolian, a modal account is necessary.

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